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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,173	03/26/2004	Yee Loong Chin	70030949-1	7995

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EXAMINER	
LIVEDALEN, BRIAN J	

ART UNIT	PAPER NUMBER
2878	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/810,173	CHIN ET AL.	
	Examiner	Art Unit	
	Brian J. Livedalen	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *07 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-22 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on *13 September 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This action is in response to amendment filed 5/7/2007. Claims 1-22 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-22 are under 35 U.S.C. 103(a) as being unpatentable over Wijntjes et al. (2005/0002032), (priority from provisional 60/468286 Filed May 5, 2003) in view of Hofler et al. (4958072).

In regard to claim 1, Wijntjes discloses (fig. 4, fig. 10A) a polaroid encoder system for detecting movement, the system having a movable polarizing code element (114); the polarizing code element having a first concentric code (754), a second concentric code (752), and a set of quadrants, the first and second concentric codes are adjacent one another over one of the four quadrants of the movable polarizing segment (page 7, paragraph 00105); a detector module to detect an amplitude based on how much illumination passes through a first portion of the movable polarizing code element, the detector module having a illumination light detector (120A) covered with a first static polarizing filter (116A) that is oriented in a first direction; a second illumination detector

(120B) covered with a second static polarizing filter (116B) that is oriented in a second direction (page 4, paragraphs 0067, 0068); a first determination module to identify a quadrant of the movable polarizing code element based on how much illumination passes through a second portion of the movable polarizing code element; the first determination module responsive to a single illumination source that emits light that is directed at and unaltered before encountering the movable polarizing code element and thereafter unaltered before encountering a third illumination detector (fig. 16A, 802A); and a second determination module (fig. 16B, 804) coupled to receive the amplitude and the quadrant and to determine an angular position of the movable polarizing code element using the amplitude and the quadrant (page 7, paragraphs 0106-0112). Wijntjes fails to disclose the concentric codes being in contact with one another. However, Hofler discloses (fig. 2) a polarization encoder that uses two concentric codes (56, 60) that are in contact with one another over one of four quadrants (column 4, lines 40-51). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the polarizing code element of Wijntjes by placing the codes in contact with each other as taught by Hofler in order to reduce the minimum size of the code element, allowing for a more compact system.

In regard to claim 9, Wijntjes discloses (fig. 4, fig. 10A) a method for determining angular position of a movable polarizing code element, the method including illuminating the movable polarizing code element, the polarizing code element having a first concentric code (754), a second concentric code (752), and a set of quadrants, the first and second concentric codes are adjacent one another over one of the four quadrants

of the movable polarizing segment (page 7, paragraph 00105); the illuminating including an illumination source such that emitted light is directed at and unaltered before encountering the movable polarizing code element and thereafter unaltered before encountering a third illumination detector (fig. 16A, 802A); detecting a first amplitude based on how much illumination passes through a first portion of the movable polarizing code element and a first static polarizing filter (116A) oriented in a first direction; detecting a second amplitude based on how much illumination passes through a first portion of the movable polarizing code element and a second static polarizing filter (116B) oriented in a second direction (page 4, paragraphs 0067, 0068); determining a quadrant of the movable polarizing code element based on how much illumination passes through a second portion of the movable polarizing code element; and determining the angular position of the movable polarizing code element using the first amplitude, the second amplitude and the quadrant (page 7, paragraphs 0106-0112). Wijntjes discloses using photodetectors (120A, 120B; fig. 16A, 802A) to perform detection of the first and second amplitudes and determining the quadrant, but fails to disclose using photodiodes. However, Wijntjes teaches using a photodiode to perform measurement of the polarizing disc in another embodiment (page 3, paragraph 0046). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use photodiodes to detect the positioning of the disc in order to accurately, yet inexpensively, detect the light impinging on the detectors. Wijntjes fails to disclose the concentric codes being in contact with one another. However, Hofler discloses (fig. 2) a polarization encoder that uses two concentric codes (56, 60) that are in contact with

one another over one of four quadrants (column 4, lines 40-51). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the polarizing code element of Wijntjes by placing the codes in contact with each other as taught by Hofler in order to reduce the minimum size of the code element, allowing for a more compact system.

In regard to claim 17, Wijntjes discloses (fig. 4, fig. 10A) a system for determining angular position of a movable polarizing code element, the system including means for illuminating the movable polarizing code element (110), the polarizing code element having a first concentric code (754), a second concentric code (752), and a set of quadrants, the first and second concentric codes are adjacent one another over one of the four quadrants of the movable polarizing element (page 7, paragraph 00105); means for illuminating including a single illumination source that emits light that is directed at and unaltered before encountering the movable polarizing code element and thereafter unaltered before encountering a third illumination detector (fig. 16A, 802A); means for detecting a first amplitude based on how much illumination passes through a first portion of the movable polarizing code element and a first static polarizing filter (116A) oriented in a first direction (120A); means for detecting a second amplitude based on how much illumination passes through a first portion of the movable polarizing code element and a second static polarizing filter (116B) oriented in a second direction (120B) (page 4, paragraphs 0067, 0068); means for identifying a quadrant of the movable polarizing code element based on how much illumination passes through a second portion of the movable polarizing code element; and means for determining the

angular position of the movable polarizing code element using the first amplitude, the second amplitude and the quadrant (page 7, paragraphs 0106-0112). Wijntjes fails to disclose the concentric codes being in contact with one another. However, Hofler discloses (fig. 2) a polarization encoder that uses two concentric codes (56, 60) that are in contact with one another over one of four quadrants (column 4, lines 40-51). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the polarizing code element of Wijntjes by placing the codes in contact with each other as taught by Hofler in order to reduce the minimum size of the code element, allowing for a more compact system.

In regard to claims 2, 3, 10, 15, 16, and 18, Wijntjes discloses (fig. 16B) a controller module (810) coupled to receive angular position of the movable polarizing element and the controller module uses the angular position to control a movable device coupled with the movable-polarizing code element; wherein the controller module is a motor controller (page 6, paragraph 0095 "motion control and measurement for various types of motors", page 7, paragraph 0111).

In regard to claims 5 and 22, Wijntjes discloses using photodetectors (120A, 120B; fig. 16A, 802A) to perform detection of the first and second amplitudes and determining the quadrant (with static polarizing filters covering detectors 120A and 120B), but fails to disclose using photodiodes. However, Wijntjes teaches using a photodiode to perform measurement of the polarizing disc in another embodiment (page 3, paragraph 0046). It would have been obvious to one of ordinary skill in the art at the

time the invention was made to use photodiodes to detect the positioning of the disc in order to accurately, yet inexpensively, detect the light impinging on the detectors.

In regard to claims 6, 11, 12, 19 and 20, Wijntjes in view of Hofler discloses a system and method as set forth above. Wijntjes fails to disclose the codes being opaque. However, Hofler further discloses (fig. 2) that the first and second concentric codes are substantially opaque (column 4, lines 40-51). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wijntjes by incorporating opaque codes in order to reduce manufacturing costs by printing the opaque code onto the code element. Wijntjes in view of Hofler discloses that the opaque code substantially obscures the illumination received by the illumination detector of the means for identifying the quadrant.

In regard to claim 7, Wijntjes discloses in Wijntjes (fig. 14) that the first and second concentric codes are located in a segment of the second portion of the movable polarizing code element.

In regard to claims 8 and 13, Wijntjes discloses in Wijntjes (fig. 16A) that the first determination module further has a second illumination detector (802B) located on the same side of the movable polarizing code element as the first and second illumination detectors of the detector module (page 7, paragraph 0106-109).

In regard to claim 16, Wijntjes discloses detecting how much illumination passes through the second portion of the movable polarizing code element

In regard to claims 4, 14, and 21, Wijntjes discloses a polaroid encoder which uses two detectors each covered by a polarizing filter. Wijntjes also discloses a third

detector with polarizing filter. The three filters are each 120 degrees out of phase, which is the maximum amount that three filters can be out of phase (page 2, paragraph 0018). Therefore, Wijntjes teaches placing filters out of phase with each other at the maximum amount, but fails to disclose the first two filters being 90 degrees out of phase. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the first two filters of a two filter system 90 degrees out of phase so that the two filters are the maximum amount out of phase, allowing the greatest possible precision.

Response to Arguments

Applicant's arguments filed 5/7/2007 have been fully considered but they are not persuasive. Applicant suggests that the added limitation overcomes Wijntjes in view of Hofler because the light source is unaltered before being detected by the first determination module. Applicant points to the polarization analyzers (116) in Wijntjes as support. However, in the previous office, as well as the present, Examiner points to element 802A in fig. 16a as the determination module. The light detected by 802A does not pass through analyzers (116). *See* page 7, paragraph 0108. Like Applicant's disclosure, Wijntjes discloses a separate detector that detects light unaltered by the analyzer (116). Accordingly, Applicant has failed to overcome Wijntjes in view of Hofler.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Livedalen whose telephone number is (571) 272-2715. The examiner can normally be reached on 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

THANH X. LUU
PRIMARY EXAMINER

bjl